What is the largest four digit number, which when divided by 19 leaves a remainder of 7.

Here are the options:$a.9972 \quad b.9976 \quad c.9978 \quad d.9982$

Solution:

Division with remainder is finding the largest integer that is the product of a divider provides value not greater than the dividend. The required number is called incomplete quotient. The difference between the dividend and the product of a divider on a partial quotient is called the remainder, is always less than the divisor. The general form of a linear equation can be expressed as $a = b \times q + r$. In this equation, q can be referred to as the quotient and d as the divisor, while r as the remainder. The equation can be transformed to find the remainder as: $r = a - b \times q$. Additionally, a and b must be natural numbers, with b being non-zero. The quotient is the integer result (rounded down) of the division of a by b. The remainder must also be an integer. If a and b are natural numbers, with d non-zero, it can be proven that there exist unique integers q and r, such that $a = b \times q + r$ and $0 \leq r < b$. The number q is called the quotient, while r is called the remainder.

Firstly we divide to get a whole number and a decimal for each option:

$a.\frac{9972}{19} = 524{,}8421053$

$b.\frac{9976}{19} = 525{,}0526316$

$c.\frac{9978}{19} = 525{,}1578947$

$d.\frac{9982}{19} = 525{,}3684211$

Subtract the whole number part for each option:

a. Subtract 524 get $0{,}8421053$, multiply the above by 19 to get 16.0000007rounding gives the remainder of 16.

b. Subtract 525 get $0{,}0526316$, multiply the above by 19 to get 1.0000004 rounding gives the remainder of 1.

c. Subtract 525 get $0{,}1578947$, multiply the above by 19 to get 2.9999993 rounding gives the remainder of 3.

d Subtract 525 get $0{,}3684211$ multiply the above by 19 to get 7.0000009 rounding gives the remainder of 7.

Answer: the largest four digit number, which when divided by 19 leaves a remainder of 7 is option $d.9982$.